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MEDICAL NEWS LETTER

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HISTORICAL FUND
of the
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute, please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

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Statement on Preparation and Use of Separated Red Cells in the Maximum Utilization of Blood

The maximum and most effective utilization of every unit of blood drawn has long been a prime goal of the American National Red Cross, the American Association of Blood Banks, and of all agencies involved in the collection, processing, and utilization of blood and blood derivatives. All such agencies have fallen short of maximum utilization in years past, especially when blood was drawn as part of any large-scale collection for plasma or plasma derivatives, and the red cells from millions of units have not been used. Most of these collections have been for the Department of Defense and Office of Civil and Defense Mobilization stockpiles, and there was reluctance to permit separation of red cells and plasma in the collecting centers.

In the spring of 1957, the National Research Council Subcommittee on Transfusion Problems became concerned with the problem of improving the salvage of red cells because of the situation then existing in the collection of blood for the OCDM for the preparation of albumin and gamma globulin. For this collection, whole blood was again being shipped to the plasma processing plants where the plasma was removed and the cells discarded. At the start, the Subcommittee agreed on the general principle that any measures taken should embrace the maximum flexibility in the handling of blood components. As they explored the various ways of solving this problem they were pleased to learn that the Red Cross had been permitted by military procurement contractors to put into operation the most obvious steps to improve the situation.

Building on the Red Cross plan, and incorporating other recommendations, the Subcommittee approved the following statement:

> In view of the great therapeutic value of whole blood and its various components, and the importance of maximum utilization of every unit of blood drawn, the NRC Subcommittee on Transfusion Problems recommends that the Joint Blood Council, Inc., the American Association of Blood Banks, the American National Red Cross, military blood banks, and any other blood banks participating in the collection of blood for the preparation of plasma or plasma derivatives adopt the following practice insofar as possible.
>
> 1. That blood drawn into plastic bags or glass bottles contain standard ACD solution, preferably Formula A.
> 2. That the requirements of the donor center for whole blood and separated red cells be projected.
> 3. That the demand for whole blood be answered whenever it can be justified, by separated red cells.

4. That, for those units not needed as whole blood, the plasma be separated from the red cells in a closed system under sterile technique in the donor center at not more than six days after donation, and that if it is intended to transfuse the residual red cells, they be maintained under storage at 4 - 6° C.

a. It is recognized that some element of risk of bacterial contamination in the separation of plasma from whole blood exists with currently available transfusion equipment, and that the degree of hazard is determined by the design of such equipment.

(1) The maximum safety is provided by the system in which both the original container (enclosing the ACD solution) with integral donor tube and attached phlebotomy needle, the container to which plasma is to be transferred, the element connecting the two containers, and all outlet ports are sterilized assembled as a unit, since transfer of plasma can be effected without entry, and the risk of contamination is reduced to the minimum of the original venipuncture. With this unit, plasma may be removed and the residual red cells transfused up to 21 days from the date of collection, provided refrigeration has been continuous at 4 - 6° C. Closure of the connecting tube shall be such as to constitute a hermetic seal.

(2) If the container used for the collection of blood requires a separate donor tube, or separate connection for removal of plasma to a secondary container, the entry of the original container for plasma withdrawal must be through a site other than that used for collection, and this site must be such that sterility can be maintained throughout the period during which the blood is refrigerated prior to removal of plasma. If these conditions are met and the residual cells are stored continuously at 4 - 6° C., they may be transfused up to 21 days after collection. If the conditions are not met, the red cells must be transfused within 24 hours after removal of plasma. In either case, special precautions should be taken to maintain the temperature at 4 - 6° C. throughout the period of processing and storage.

b. The Subcommittee emphasized that no resuspending medium is necessary for separated red cells as long as enough of the original plasma is left with the cells to yield a hematocrit of not more than 70%. Increasing the pressure on the blood will usually provide an adequate flow rate. Introduction of air under pressure into the original container to increase flow rate should never be permitted because of the risk of air embolism. The addition of a resuspending medium or additive, as well as the practice of washing the cells, is ordinarily very undesirable because of the increased hazard of contamination. When washing of cells is desirable, it should be done only immediately before transfusion.

Separated red cells, because of the small amount of plasma present, are relatively unprotected against sudden changes in tonicity

and electrolyte balance. The "tandem" or simultaneous infusion-transfusion technique through a single venipuncture is potentially dangerous because red cells may then be fully exposed to the effect of ordinary intravenous solutions.

5. That the plasma separated from the red cells under sterile precautions be shipped to a central processing laboratory. Conditions for shipment would ordinarily include pooling of the plasma, freezing at -20° C., and shipment in the frozen state. Departures from these conditions may be acceptable provided adequate bacteriological control is maintained.

6. That at the processing laboratory, conversion to one of the following be undertaken:

a. Plasma stored at 32° C. for six months according to the recommendations of the NRC Subcommittee on Plasma.

b. Plasma partially fractionated and heated for 10 hours at 60° C. in accordance with the recommendations of the Subcommittee on Plasma.

c. Albumin and gamma globulin, and such other fractions as may be desired, prepared by processes accepted by the National Institutes of Health.

The Subcommittee believes that the plan, which has already been adopted by the Red Cross, permitting the separation of cells from plasma in the collection centers, permits the maximum flexibility in the utilization of blood through donor centers, and aids them considerably in maintaining an adequate reserve of needed groups. The separation of red cells from plasma early in the course of storage yields a better grade of plasma with minimum hemolysis and with a good yield, since centrifugation can be used in place of sedimentation. Other advantages under this plan are the following:

1. It places the responsibility for handling the cells with the collecting agency from the time they are collected to the time they are distributed. This eliminates division of responsibility for sterility and identity, and the very real problem of maintaining identity of cells in the fractionating laboratory.

2. The problem of extra trauma to the cells in shipping is obviated.

Furthermore, the Subcommittee hopes that knowledge of the indications for the use of separated red cell transfusions will become more widespread. Separated red cell transfusions correct anemia with the least disturbance to blood volume for any case in which the administration of whole blood involves the danger of overloading the circulatory system. They are often preferable to whole blood in transfusion therapy of chronically anemic, elderly, or debilitated patients, cardiac and renal cases and infants in whom an increase in plasma volume may be undesirable.

By using differential sedimentation or centrifugation, safe and satisfactory preparations of platelets or of a platelet-rich fraction may also be obtained which, when derived from fresh blood (not over 24 hours old), may have important therapeutic effect in thrombocytopenic patients.

The increase in demand for gamma globulin gives urgency to the maximum utilization of plasma. New attempts to eliminate or avoid the hepatitis hazard in relation to the coagulation fractions may make their salvage also of major importance.

Therefore, everything possible should be done to assure the complete utilization of all components of blood, and the Subcommittee on Plasma joins with the Subcommittee on Transfusion Problems in urging all parties involved to achieve this goal for all blood drawn in the United States.

(National Academy of Sciences, National Research Council, Division of Medical Sciences; Statement approved by Subcommittee on Transfusion Problems, 17 October 1958)

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Nutrition in Internal Medicine

In the distant past, nutrition was interpreted in essence solely in terms of caloric intake whether adequate, inadequate, or in excess as related to weight. Although it was known two centuries ago that the clinical syndromes of beriberi and scurvy responded to some substance included in food, and others of the deficiency diseases had been described, it was not until 1913 that the entity of vitamin A deficiency was established. The essential need for other vitamins was then rapidly recognized and knowledge of deficiency states or disease entities quickly advanced. Thus, was ushered in the era of the vitamin diseases—an era not yet closed because the demonstration of new vitamins and their need continues apace. Knowledge of the specificity of the amino acids and of fatty acids as essential elements in the synthesis of tissues has broadened concepts of the role of proteins and fats in nutrition. And, finally, there is an expanding appreciation that minerals are essential to the living processes of the cell and organism—iron, iodine, potassium, sodium, and those minerals which appear in trace amounts—but in some instances play essential roles in the metabolic processes of the cell.

In the presumed metabolic equilibrium which determines health, the essential elements of nutrition must be presented to the tissues in such amounts that the metabolic needs of the cells may be met. Insufficient amounts of these essentials, whether in intake or because of malabsorption or of circumstances interfering with their utilization by the cell, or because of a heightened need, threaten disease. An excess of certain elements also may lead to abnormalities in the metabolic processes and, thus, again

constitute disease. Yet it is not as simple as this for all too commonly the factors related to these abnormalities are so complex that the interrelationships are not clear.

The appetite of the normal adult usually keeps pace with metabolic needs and the weight shows little fluctuation. But appetite sometimes remains a fixed variable, although need is lessened as is well demonstrated upon the adult's entry into middle age at a time when physical activity may be decreased and hormonal alterations may play a part, but appetite may continue at its previous level with increasing weight. Not infrequently, obesity stems from a habit of excessive eating, a characteristic of the family which sets a "good table." And then there is that excess of eating, a psychiatric equivalent to alcoholism, a substitute in satisfying an emotional need. Decreased metabolic needs reflected in weight gain are well shown in hypothyroidism.

Obesity is a common problem for the internist, especially in his management of the middle-aged patient. This is a problem to be faced because herein lies possibly the major consideration in preventive medicine in this country now that infectious diseases have become a minor hazard. The association with obesity of diabetes mellitus, arteriosclerosis, osteoarthritis, and of hypertension with resultant heart disease makes the control of obesity a daily responsibility of the practicing internist in the prevention of disease and in extending the patient's life into healthful years.

The effects of obesity upon the cardiovascular system are specific and because the most common cause of death lies in the sphere of cardiac disease, it deserves particular emphasis. Not only does obesity require increased work of the aging myocardium as the individual transports pounds of inert tissue from place to place, but the increased blood volume required to provide the oxygen and nutrients to this mass of tissue presents to the heart a load of work which should and can be avoided. Added to the load of work may be the common accompaniment of arteriosclerosis which—if of the coronary arteries—reduces the effective blood flow to the myocardium. Recently, studies of pulmonary function have clearly shown that increased intra-abdominal pressure or increase in girth is accompanied by a decrease in expiratory reserve and that in the extreme instance there may actually be a relative ventilatory insufficiency.

Undernutrition—of whatever cause—must be given attention either in a search for its cause and correction or in an effort to supply the needed calories by whatever means and modifications of diet that may be necessary. Such dietary means must include also consideration of the adequacy of the diet in factors other than calories, for not only is this undernutrition, but practically always malnutrition as well, expressed as an inadequacy of essential dietary factors.

Even though undernutrition may not be apparent in terms of calories or weight loss, malnutrition may be reflected in an inadequacy of essential

factors which cannot be synthesized within the body. Such deficiency states may not be recognized in an early state unless they are kept in mind in taking a dietary history.

The normal person—unless a food fadist—almost always ingests quantities of protein sufficient to insure an adequate supply of the essential amino acids and to remain in positive nitrogen balance. One may encounter instances of protein deficiency in those who have poor dietary habits or are unable to buy protein foods, and in women who have had excessive demands upon available proteins during pregnancy and lactation. But protein deficiency must be suspected and searched for particularly in those who through poor judgment have been advised to use low protein diets or in those who have lost blood through bleeding and have had a diet insufficient in protein. Commonly, protein deficiency represents only one phase of malnutrition or malabsorption in diseases of the gastrointestinal tract.

Protein deficiency and, more specifically, deficiency of essential amino acids constitute phases of nutrition not infrequently overlooked and to be considered particularly in the chronically ill patient. The symptoms of weakness resulting from such deficiencies may be thought to be related to vitamin deficiency and, in view of the metabolic relationships between certain essential amino acids and members of the B complex, their interrelationship in respect to symptoms possibly cannot be denied. Dietary management should include recognition of these facts.

Deficiencies in vitamins usually are anticipated as an accompaniment of undernutrition or malnutrition, but one should be equally aware of the possibility of a vitamin deficient state in the presence of calorically adequate nutrition.

The "vitamin era" has not drawn to a close. Not infrequently, the role of a vitamin or the effect of its absence has been clearly established in the experimental animal, but many years may pass before its place in human metabolism can be established. Thus, at some future date, such data relative to vitamin E and to pantothenic acid may be anticipated. Only recently, has the place of pyridoxine (B_6) been fixed in the body economy and the relative deficiency which accompanies antituberculosis therapy with INH been shown.

The role of folic acid in deficiency states has not been completely established. That it has a place in hematopoiesis (deficiency resulting in macrocytic anemia) and in normal intestinal absorption is without question, but certain other possible effects have not been clarified. For example, it has been shown to reverse glossitis unassociated with symptoms usually thought to be characteristic of sprue, and in persons with no evidence of anemia.

Another interesting phase of vitamins in nutrition concerns the antivitamins or vitamin antagonists, substances which compete with vitamins in enzyme systems, destroy them, or bind them so that they are ineffective.

There is growing knowledge of these effects which may be of far-reaching influence on the body economy.

The minerals playing a role in the body economy are also to be considered in the nutritional aspects of health. The importance of sodium, potassium, calcium, phosphorus, iron, and iodine is appreciated. Although there is less positive information regarding many of the trace metals, their place in metabolic processes, in some instances, has been finally established. The need for iron in the prevention of iron deficiency anemia with, at times, attendant symptoms of the Plummer-Vinson syndrome, is common knowledge. Other than iron deficiency on the basis of intake in early childhood, deficiency of iron occurs usually with inadequate replacement of losses by bleeding; in women in the lower economic levels with a rapid succession of pregnancies and/or menorrhagia, the diet may be inadequate to replace iron lost. There are also the mild anemias of the iron deficiency type, hardly recognized, in chronic disease. Who can say whether the minimal or relative anoxia of a mere reduction of 2 gm. percent of hemoglobin has a deleterious effect upon a myocardium already damaged, or in the metabolic processes of tissues already impaired by chronic disease? There is reason to believe that such subclinical anemias or anoxia play a part in chronic disease and in its response to therapy.

The nutritional and metabolic interrelationship of calcium, phosphorus, parathormone and vitamin D are well known, as are the effects of their provision in excess or in insufficient quantity. The place of iodine in the body economy was established long ago and is well understood in its clinical implications as related to the thyroid hormone. Its deficiency especially presented a nutritional problem in the past because of colloid goiter and this is still an important problem in preventive medicine in certain areas of the world, not only in the adult, but in the offspring as well. The role of cobalt in the enzyme systems of hematopoiesis was revealed only with the isolation of vitamin B_{12}. The part fluorine plays in dental health is recent knowledge; whether or not this element has other roles is not known. Recent studies indicate that magnesium and copper have active parts in the metabolism of certain tissues. The roles of zinc and cadmium are still in the shadows, but they probably will be on the clinical stage at some future time. (Kampmeier, R.H., Nutrition in Internal Medicine: Am. J. Med., XXV: 662-665, November 1958)

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Please forward requests for Change of Address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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Spontaneous Strokes in the Young

The spontaneous occurrence of cerebrovascular accidents in normotensive healthy individuals is contrary to the conventional notion that arteriosclerotic and occlusive vascular disease of the brain is a phenomenon of old age. Yet, strokes in the young are not rare. Thirty-two such cases in young adults and two in children have been encountered by the author in private neurologic practice in the last 7 years.

Acute hemiplegia and other focal neurologic manifestations characterize this group. The ages range from five and one-half to forty-five years, the arbitrary cut-off point of this selection. No cases are included that had traumatic infectious, neoplastic, hypertensive, vascular, or any other disease. All subjects were ambulatory and active. Most of the patients were white-collar workers, representative of the population of Washington, D. C. and its immediate environs. No Negro patients satisfied the criteria for the group.

Although the precise etiologic mechanism was not always established, two large categories of strokes in the young could be recognized: those due to venous and those due to arterial thrombosis:

1. Cerebral Venous Thrombosis
   (a) Infantile hemiplegia
   (b) Puerperal hemiplegia
   (c) Venous thrombosis of pregnancy
2. Cerebral Arterial Thrombosis
   (a) Carotid artery
   (b) Middle cerebral artery
   (c) Other arteries of the circle of Willis, single or in combination

Infantile hemiplegia—a well recognized syndrome—is characterized by sudden onset of hemiplegia, often with convulsions in children less than one year of age. It is due to venous or sinus thrombosis. It may occur spontaneously, but almost almost always is associated with fever or dehydration. Twenty such cases have been encountered and are the subject of a separate article.

Puerperal hemiplegia is probably the most common form of spontaneous stroke in healthy women. It is characterized by the sudden onset of headache, convulsions, hemiplegia, or other focal neurologic signs during previously healthy puerperal period. It appears from several hours to several weeks postpartum and is due to cortical venous thrombosis. The clot may propagate to other veins or to the dural sinuses. The precise mechanism is unknown and, only in recent years, has this condition been recognized

during life. Twelve such cases have been observed, 8 of which were previously reported. All recovered and there have been no recurrences. Three patients have had subsequent pregnancies and deliveries without complications. Minor neurologic sequelae persist in three of the 10 cases.

This group of "strokes" accompanying gestation and parturition should be segregated from cases due to arterial occlusion and also should be distinguished from a large number of diseases that simulate the puerperal hemiplegia and venous thrombosis of pregnancy. Eclampsia is probably the most frequent erroneous inference. Treatment for the latter condition would be contraindicated in puerperal hemiplegia.

In contrast to the three subgroups due to cerebral venous thrombosis, strokes in healthy active individuals may occur from arterial occlusion. Sixteen such cases under 45 years of age were selected. The youngest was a five and one-half-year old girl who suffered a spontaneous carotid artery thrombosis and recovered without any residuals. One 13-year old child still has a left hemiparesis 5 years after the acute episode. In the adult cases, the ages range from 23 to 44 years.

The degree and pattern of acute neurologic involvement in these 16 cases varied and included complete hemiplegia, aphasia, homonymous hemianopsia, hemihypesthesia, and thalamic syndrome. Most attacks were relatively brief, lasting several hours to several weeks, and usually with minimal sequelae. None died. The worst residual was a hemiparesis associated with a mild convulsive disorder. Homonymous hemianopsia and field defects persist in 3 men, unilateral optic atrophy in 2 women. One 28-year old man suffered a recurrence of aphasia and hemiparesis 2 years after the first attack with no sequelae after 24 hours and no symptoms 3 years later. Transient brief recurrences appeared on two occasions in one patient, and on three occasions with another. Eleven patients have been followed for 3 years of longer.

The cause of cerebral arterial thrombosis is atheromata, analogous to, if not identical with, the atheromatous process that occurs in coronary vessels and elsewhere. Some studies suggest that the cerebral artery is more vulnerable to atheromatous plaque formation because of certain inherent structural weaknesses.

Plaques that cause strokes in the young healthy normotensive patient are probably solitary. This assumption seems plausible because none of the patients died, residuals were uncommon, and all except one case, whose follow-up was too brief, are engaged in productive activity. None has shown electrocardiographic changes or other evidence of progressive vascular disease. None had diabetes, subarachnoid bleeding, or syphilis. The electroencephalogram was normal in six cases and abnormal in two, including one patient with residual hemiplegia.

As in coronary artery occlusion in a comparable age group, the patients were predominantly male.

Diagnosis of carotid artery thrombosis can often be made by clinical observation, including a history of acute onset of headache with contralateral hemiplegia and ipsilateral Horner's syndrome. Palpation of the carotid artery and ophthalmo-dynamometry are valuable but not infallible techniques that deserve more frequent usage. Arteriography is often indispensable, particularly to exclude intracranial aneurysm or tumor, but unnecessary, painful, or dangerous tests can often be circumvented by careful analysis of clinical data.

Unfamiliarity with spontaneous strokes in the young may motivate the perplexed clinician to subject the patient to a consecutive series of elaborate tests to uncover the elusive etiology. Syphilis and hypertension are easily and readily eliminated. Brain tumor, collagen disease, and congenital and acquired diseases of the vascular and hematologic systems are then sought. The multiple tests necessary to investigate these various possibilities are usually negative, but the time consumed is often sufficient to permit spontaneous improvement. An erroneous diagnosis of multiple sclerosis is then often made by exclusion.

Most spontaneous (arterial) strokes in the healthy young are due to solitary atheromatous plaques similar to those found in older patients. Stress seems to precipitate the attack in some cases.

Development of a rational therapeutic program rests on accumulation and assessment of further data, especially on pathogenesis. The usefulness of anticoagulants in the treatment or prevention of a "stroke" requires further validation. Prognosis in these selected patients was generally good with no specific treatment. The indiscriminate use of anticoagulants without proper refinement of the heterogeneous diagnosis of "stroke" is hazardous. Increased bleeding into a hemorrhage infarct is a particular danger.

Further study of strokes in the healthy young would be particularly rewarding because the causative lesion can be studied in "pure culture," without contamination of the issue by the diffuse and multiple degenerative changes accompanying strokes in elderly patients. (Stevens, H., Spontaneous Strokes in the Young: Ann. Int. Med., 49: 1022-1033, November 1958)

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Clinical Experiences with Chlorothiazide

Chlorothiazide is the generic name of a potent, orally effective, nonmercurial, diuretic agent, a substituted benzothiadiazine compound with a free sulfonamide group, which was synthesized in 1957 by Novello and Sprague and has recently been available in the United States as Diuril. Preclinical studies with this new sulfonamide have demonstrated its ability to promote the excretion of sodium and chloride (also to a lesser degree, potassium and bicarbonate) and have led to its designation as a saluretic agent.

The exact mechanism by which this drug alters ion transport in the kidney has not been completely established.

The present study was begun in April 1957 as a clinical evaluation of a new diuretic drug supplied for investigational use. The purpose was to obtain a broad working experience with this compound and to assess its role in clinical problems under conditions similar to those commonly encountered in general medical practice. Such clinical information should be of practical importance to physicians because this drug has not been generally available long enough for the average practitioner to have a comparable experience. At first, only hospitalized patients carefully controlled and under daily observation were selected, but subsequently, as experience increased and the drug was found to be well tolerated, nonhospitalized patients were included. Data on 121 patients (57 women and 64 men) from the medical and cardiovascular services of the Pennsylvania Hospital form the basis of this report. Their ages ranged from 17 to 90 with 88% of the patients between 40 and 80 years. The etiologic diagnoses with the number of patients in each category are recorded in a Table.

The patients were appraised prior to chlorothiazide therapy to insure that a diuretic agent was necessary and that all other therapeutic measures applicable in each individual case were being adequately and correctly employed, that a low salt diet was being enforced, and that digitalization, where indicated, was complete. If patients were already receiving diuretic drugs (for example, organomercurials) the latter were discontinued and the patient placed under observation without such therapy to determine the actual need for these agents. Placebo tablets were also given initially or intermittently substituted during the chlorothiazide trials.

When it was clear that a diuretic drug was indicated, chlorothiazide was given orally in divided doses varying from 0.5 to 1.5 (rarely 2.0) gm. daily or intermittently several days each week. Increases in dosage were conservative and gradual and only if the response or control was not satisfactory.

The over all individual response in this series of 121 patients was classified by the attending physicians on a clinical basis and results are summarized in a Table. It is evident that, in most of the patients, chlorothiazide was a very effective oral diuretic agent. Continued long-term therapy was simple and practical in most patients over periods up to 15 months. Brief case reports are presented illustrating the beneficial effects and problems encountered.

The pharmacologic effects and clinical benefits of diuretics depend essentially on their ability to interfere with metabolic (biochemical) processes in the kidney and these agents (especially when injudiciously employed) may lead to electrolyte imbalances. In turn, electrolyte disturbances brought about by vigorous diuretic therapy, rigid sodium restriction, or disease processes may result in a failure to respond to diuretics. It must be accepted,

however, that in advanced states of disease with impaired glomerular filtration and decreased sodium load to the renal tubules, despite maximal tubular interference by a potent drug, virtually all of the sodium presented may be reabsorbed and the anticipated diuresis may not occur.

Chlorothiazide is capable of producing electrolyte alterations under various circumstances. This is more or less a potentiality of all effective diuretics, reflecting their pharmacologic action. However, the simplicity of administration and effectiveness of chlorothiazide may make such complications more likely. Profound diuresis, multiple therapies and procedures, and complications of vomiting and diarrhea should be avoided or taken into account if the diuretic must be administered. Therapeutic dosages not accompanied by an effective response should not be maintained because the excretion of desirable electrolytes may be induced.

Certain patients appear to be more responsive to the kaliuretic effect of chlorothiazide than others. Perhaps under circumstances in which sodium is avidly retained or not readily available for excretion—as in rigid dietary sodium restriction, sodium depletion, and certain disease states—potassium or other cations, rather than sodium, may accompany the chloruresis and lead to the depletion of these ions. Careful clinical observation, periodic electrolyte determinations, and supplements of potassium salts or citrus fruit juices in the diet are recommended for patients receiving this drug over any prolonged period of time.

The enhancement of the hypotensive effect of various antihypertensive drugs (and surgical splanchnicectomy) has been attributed to the natriuretic-diuretic effect of chlorothiazide with reduction of total body sodium and fluid. A direct hypotensive effect of the drug, in addition, has also been suggested. In any event, a reduction in dosage of antihypertensive drugs, especially the ganglionic-blocking agents, by one-half or more when chlorothiazide is added to the therapeutic program, is advised in order to avoid an excessive fall in blood pressure. It is to be recalled that this drug is a sulfonamide and it is probable that a broader experience with it will reveal some sensitivities and allergic responses characteristic of this group of compounds. (Dinon, L. R., Kim, Y. S., Vander Veer, J. B., Clinical Experience with Chlorothiazide (Diuril) with Particular Emphasis on Untoward Responses - A Report of 121 Cases Studied over a 15-Month Period: Am. J. Med. Sci., 236: 533-544, November 1958)

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Pneumonectomy in Pulmonary Tuberculosis

The surgical resection of residual or persistent disease following adequate medical treatment has achieved a firm place in management of the individual with pulmonary tuberculosis. Excellent early as well as late results have been obtained following subsegmental, segmental, and lobar resections. However, the morbidity and mortality of pneumonectomy have remained high. The long-term follow-up studies of patients surviving pneumonectomy have revealed varying results.

Sixty-six of 101 patients undergoing pneumonectomy were women and 35 were men. At the time of operation, the youngest patient was 13 years old and the oldest, 72 years old. The majority of the patients were in the third and fourth decades. Forty-four patients were of European descent, 56 were Negroes, and one was of Asian descent. The known duration of the disease before pneumonectomy varied from 1 to 19 years, the majority of patients having had the disease from 1 to 5 years.

The indication for pneumonectomy was a destroyed lung in 34 patients, extensive disease throughout the lung in 32, thoracoplasty failure in 26, bronchiectasis with active tuberculosis in 2, extensive cystic disease subsequent to moderately advanced tuberculosis in 1, massive pulmonary hemorrhage in 1, and technical reasons during a contemplated lesser resection in 5 patients. Concomitant pleural or bronchial disease was present in a number of patients.

In the present series of 101 pneumonectomies performed in the treatment of pulmonary tuberculosis, it remains evident that the procedure is a formidable one. The extensive pathologic involvement necessitating the procedure and the apparent lack of sufficient natural resistance of the patient to his disease make the situation hazardous. Moreover, the frequent involvement of the contralateral lung by previous disease with concomitant decrease in pulmonary reserve makes the necessary physiologic adjustments of the cardiorespiratory mechanics difficult. Yet in such a group of patients, in whom both medical and lesser surgical procedures have failed to control the disease process, such a high-risk procedure is justified in an attempt to salvage the patient so that he may return to his place in society.

Cardiorespiratory failure was the most common cause of early postoperative death. With application of routine pulmonary function studies, however, most deaths of this type may be eliminated. In the occasional patient in whom such an event occurs or is precipitated by extension of contralateral disease, the employment of a mechanical respirator as advocated by Bjork and Engstrom may be life-saving. Recently, it has been possible to foretell such a complication by the use of cardiac catheterization with a balloon type of catheter. Tuberculous complication, i.e., contralateral disease, bronchopleural fistula, and empyema, continue to

occur frequently. However, in no case was ulceration of the bronchial stump noted.

The records of the 101 patients subjected to pneumonectomy in the treatment of pulmonary tuberculosis were reviewed and 2- to 7-year follow-up data of survivors obtained. The 60-day mortality was 10.8%. Fourteen of the 90 patients surviving the early postoperative period are known to be dead and 7 were lost to follow-up observation after discharge from the sanitarium. Sixty-nine patients are known to be alive, 65 with inactive disease; the activity of the tuberculous process persists in 4 patients.

Cardiorespiratory failure was the most common cause of early death. Tuberculous complications were frequent causes of late mortality; their occurrence indicates a poor prognosis. The incidence of infectious sputum, interrupted antimicrobial therapy, and acute endobronchitis was high in this group. This is in contrast to the lower incidence of these findings in patients who sustained either no complications or minor nontuberculous complications, and in the surviving patients, it is of good prognostic significance. In the latter patients, satisfactory long-term survival with inactive disease is the usual course. (Shields, T.W., Lees, W.M., Fox, R.T., Pneumonectomy in the Treatment of Pulmonary Tuberculosis: Am. Rev. Tuberc., 78: 822-830, December 1958)

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Treatment of Peripheral Nerve Injuries

Physiological and Pathological Considerations

The Nature of Nerve Regeneration. The individual nerve cell with its peripheral end-organs, sensory or motor, provides the key to the pathology and treatment of injuries of the larger peripheral nerves. If the body of the nerve cell proper is destroyed, the neuraxons degenerate and recovery is impossible. If the cell body proper is not injured but the neuraxon simply is divided, the proximal end of the divided axon will resume growth, peripherally, from the point of its severance.

If the two ends of the divided neuraxon are promptly opposed to each other, the distal segment provides a natural pathway for the outgrowing axon until the axon reaches its proper sensory end-organ or motor end-plate. When either of these respective end-organs is reached by a regenerating axon, anatomical and physiological union is established and if other factors, presently to be discussed, are favorable, sensory or motor function returns.

If the cell body is uninjured, but the neuraxon is divided and the proximal stump is not approximated to the distal stump, the neuraxon will continue to grow peripherally, but will not advance along its original and natural pathway; instead, it will become deflected and will grow into a disorganized and

matted mass of redundant neuraxon at the proximal end of the divided neuraxon. This will eventually form a terminal neuroma. If the neuraxon be a sensory one, then noxious stimuli applied to the neuroma, particularly compression, traction and contusions, will cause painful afferent impulses to travel centrad along the axon to the spinal cord and eventually to the brain where conscious pain will be experienced, referred to the peripheral distribution of the axon.

Rate of Growth of Regenerating Neuraxons. For many years, it has widely accepted that the rate of growth of a regenerating neuraxon was close to 1 mm. a day, or roughly, 1 inch per month.

The Survival Time of Denervated Muscle. Degeneration invariably follows denervation. The rate, however, at which it takes place varies considerably in different species of animals, different animals of the same species, and different muscles in the same animal. In laboratory animals, the evidence indicates that the duration of denervation compatible with recovery of useful function varies from two months (in the cat) to two years (in the oppossum). In man, however, there is an appalling paucity of reliable data on this important point.

During World War II, experience both in England and the United States led to the general impression among those treating nerve injuries that the maximum period of denervation compatible with good functional recovery of skeletal muscle in man was about 20 months, the exact period being influenced by the level of the lesion, the distance of axonal growth necessary for reinnervation, and the amount and kind of physiotherapy given the muscle during its period of denervation.

The Time-Distance Factor. If is be accepted that the life expectancy of a denervated muscle is 20 months and the rate of regeneration of a neuraxon is 1 inch per month, immediately it becomes evident that here is an important "time-distance" factor affecting recovery in all peripheral nerve injuries.

Determination of Returning Function after Peripheral Nerve Injury. After a peripheral nerve has been severed and successfully resutured, recovery of function does not take place simultaneously in all of the muscles supplied by the nerve distal to the repair. Instead, as the neuraxons grow peripherally, the most proximal muscles will be first innervated by this nerve and the remaining muscles will be "serially" reinnervated in the order of their distance from the site of suture.

Normally, if a nerve trunk receives a blow anywhere along its course, the patient will feel pain referred to the peripheral sensory distribution of that nerve. For example, if the median nerve in the forearm is struck a blow, the patient would experience a tingling sensation referred to the thumb, index and middle fingers. (This is known as "Tinel's sign" and is invaluable evidence of sensory nerve regeneration.) If, however, the median nerve be divided in the forearm; percussion of the nerve trunk distal to the division

of the nerve will not result in painful or tingling sensation in the thumb or fingers. The Tinel sign is significant when the painful response is elicited by percussion over the nerve trunk distal to the nerve suture.

Clinical Considerations

Concussion. Concussion of a peripheral nerve is analogous to concussion of brain or spinal cord. It may follow a sudden direct blow to the nerve of moderate or even mild severity. The effect is a temporary interruption of normal physiological function of the nerve, without accompanying structural change in the nerve trunk, followed by rapid and full recovery within a matter of a few minutes, or at most, a few hours. An example of concussion of a peripheral nerve is that which occurs when a person strikes the ulnar nerve as it enters the ulnar groove at the elbow ("strikes his crazy bone"). Following such a blow there is temporary disturbance of the sensory and motor functions of the nerve which lasts only a few moments. Similar loss of function might occur if a missile strikes the shaft of the humerus a slight distance from the spiral groove without actually striking the nerve itself. The diagnosis of concussion is established by the spontaneous recovery of function within a matter of minutes, hours, or at most, a few days. No specific therapy is needed.

Contusion. Contusion of a nerve follows trauma of somewhat greater severity than that which produces a concussion and it is characterized by structural changes in the nerve trunk, such as edema and minute petechial hemorrhages from nutrient vessels of the nerve trunk. As with contusion of the brain and spinal cord, the pathophysiological and clinical manifestations of contusion of a peripheral nerve follow immediately upon the effects of concussion and prolong the effect of concussion. Days or even weeks may be required before the swelling subsides and the petechial hemorrhages absorb and normal physiological function of the nerve is resumed. Again, there is no specific therapy other than rest; healing, insofar as it takes place, occurs spontaneously within a matter of days or, at most, weeks. This healing may be complete if the structural changes in the nerve following trauma are limited to edema and petechial hemorrhages. A significant number of complete physiological interruptions of function in peripheral nerves occurring immediately after "closed" injuries to extremities are due merely to contusion and will clear up spontaneously within a few weeks. It is, therefore, important in "closed" injuries to allow sufficient time for this spontaneous recovery to occur before exploring the nerve except in those cases in which the "time-distance" ratio is critical. (Scarff, J.E., Peripheral Nerve Injuries - Principles of Treatment: Med. Clin. N. America, New York Number, 611-640, May 1958) (OccMedDispDiv, BuMed)

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Occupational Health Highlights - American Public Health Association's Meeting

The eighty-sixth annual meeting of the American Public Health Association was held October 27 - 31, 1958 in Kiel Auditorium, St. Louis, Mo. Registration was followed by an Association Symposium, "The Politics of Public Health" (not politics in public health). The speakers were the Mayor of St. Louis and the Assistant Secretary for Legislation, Department of Health, Education, and Welfare, Washington, D. C. The panel members who reviewed Politics of Public Health were outstanding physicians, health educators, and nurses. The talks and panels were open discussions on how things get done in a community both through organized political action in government and through other means of mobilizing community forces to improve health and services to the people.

Occupational Health Section. The Chairman reported that there were 41 new members and 5 applications for Fellowship in the Occupational Health Section over the past year. This was a spontaneous increase without the benefits of a membership campaign or special publicity. Of the 451 members of the Section, 138 are Fellows. The work of the committees on radiation hazards, toxicology, and noise was discussed. Nominations were made for 1958-1959 officers who were unanimously elected at a luncheon meeting on the following day.

Louis J. Cralley, Ph. D.	Chairman of Section
Seward Miller, M. D.	Vice Chairman
M. R. Zavon, M. D.	Secretary
B. E. Conley, M. D.	Member: Section Council - 5-year Term
H. Bennett, M. D.	Member: Association Nominating Committee for Elective Councilors

The Occupational Health Section, American Industrial Hygiene Association, and Industrial Medical Association held a joint meeting on the theme, "Man at Work - Some of the Problems Facing Us - 1958." The following articles were presented:

An Advancing Technology and Its Impact on Human Beings
Significance to Health of Advances in Electronics
Agricultural Industry - The Changing Pattern
Space Flight - The Health Problems Facing Us
New Sources of Power
New Resins and Plastics
New Problems with the Newer Metals

At the general session of the American Public Health Association, addresses were given by State and City officials and visitors, in addition to the Presidential Address, "Consolidation for Strength." The Sedgwick Memorial Medal was presented to Martha M. Eliot, M.D., of the Harvard School of Public Health for her distinguished service in the field of Public Health. The Delta Omega Lecture, "Preparedness and Survival: The Role of Public Health in Civilian Defense," was delivered by L. E. Burney, Surgeon General, Public Health Service.

The Occupational Health Section, Health Officers, and Health Engineers met jointly for both morning and afternoon sessions of one day. The morning session was a discussional type meeting on "Coping with Ionizing Radiation and Atmospheric Pollution" which covered functions and responsibilities of State and local agencies for radiation protection. A panel discussed problems dealing with ionizing radiation. In addition, articles were presented on: "Experience at State Level," "Experience at Local Level," "Present Status of Atmospheric Pollution in the United States," and "New Understanding from Atmospheric Research."

The afternoon session dealt with "Accident Control." The following articles were presented and discussed: "Childhood Accidents," "Better Methods for Measuring the Impact of Accidents on the Community," "The Development of a Local Accident Control Program," and "The Philadelphia Accident Study."

The Harvard Public Health Alumni Association had a dinner meeting with 200 alumni present. Dr. Tom Whayne, President of the Alumni Association, presided over the meeting and spoke briefly on matters pertaining to management and conduction of activities in the American Board of Preventive Medicine. The Dean of the Harvard School of Public Health gave a brief resume of advances made in the school. The Assistant Dean of the School spoke about the formation of a large new section in the School of Public Health which will deal with conditions that adversely affect health in working environments. Other members of the faculty spoke briefly on matters pertinent to their sections in the School.

Occupational Health and Health Officers Sections held a joint meeting on "Should an Occupational Health Program be Included in Local Health Department Activities?" An article was presented on the foregoing title and on "To Each His Own," "The Problems of Local Occupational Health Units," and "Practical Considerations: Staff, Budget, and Material."

(The objectives of the Occupational Health Section of the American Public Health Association are similar to those of the American Academy of Occupational Medicine, namely, the maintenance and improvement of health of personnel industrially employed. The Navy's Occupational Health Program, which is primarily a preventive program, strives to accomplish this for both its military and civilian personnel.) (OccMedDispDiv, BuMed)

Screening Examinations

A conference on "Screening Examinations" was conducted by the Association of Teachers of Preventive Medicine on 26 October 1958 in St. Louis, Mo., preceding the opening of the American Public Health Association's 86th Annual Meeting.

The program consisted of talks and roundtable discussions on prevention and control of cardiovascular disease, mental disorders, and cancer; control of radiation hazards; multiple screen programs; and periodic health examinations. The following excerpts from material presented should be of interest to Naval Medical officers:

Objectives of Periodic Physical Examinations

-to detect incipient chronic disease processes.
-to discern correctible deviations from the norm.
-to identify and advise on poor health habits and practices.
-to establish baselines for future reference.
-to increase the consciousness of the value of good health.
-to provide reassurance regarding known disease.
-to establish good physician patient relationship.

(New York State Health Department)

Laboratory Tests and Procedures with High Yield in Periodic Health-Maintenance Examinations

Procedure	Percentage Positive or Abnormal
Electrocardiogram	11.91%
Proctosigmoidoscopy	8.23%
Hemoglobin	6.74%
Blood Sugar	4.11%
Chest X-ray	2.88%
Urine Sugar	2.56%
Intra-ocular Pressure	2.34%
Urine Albumin	2.23%
Cytology of Cervix	0.49%

(Roberts, N.J., Periodic Health-Maintenance Examinations; Hubbard, J.P., The Early Detection and Prevention of Disease, Chapter 3, New York, Blakiston, 1957) (OccMedDispDiv., BuMed)

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Training Courses in Blood Bank and Flight Nursing

Course Title: Blood Procurement, Storage, and Utilization and Other Restorative Fluid Therapy

Curriculum will include instruction in the principles of operating a donor center, procedures for blood typing and all cross-matching methods, titration, and collection and storage of blood.

Duration: Four (4) months

Convening Date: 16 February 1959 and concludes 5 June 1959 - 31 August 1959 and concludes 18 December 1959

Place: U.S. Naval Medical School
National Naval Medical Center
Bethesda, Md.

Submission Date: Applications with enclosures to be submitted no later than 1 June 1959 for the class convening 31 August 1959

Enclosures:

1. Two (2) passport size photographs, 2-1/2 x 2-1/2
2. Obligated service agreement of 18 months after completion of course (USN and USNR)
3. In case of Reserves, in addition to obligated service agreement, an extension of active duty must be submitted to BuPers via BuMed to cover an eighteen (18) month period of obligation from completion of course.
4. Transcripts of high school, school of nursing, and other schools attended if not previously forwarded to Code 3211.

Qualifications:

1. Regular and Reserve Nurse Corps officers
2. A minimum of three (3) years active duty
3. Acceptable high school and school of nursing grades with a good background in the sciences
4. Maximum age limit - 40 years
5. Individuals with sound professional background related to this training, personal and professional maturity and stability, who can demonstrate teaching ability, skill in working with people, and are attentive to details.

Course Title: Flight Nursing

Curriculum will include orientation and indoctrination in basic principles of Aviation Medicine; will enhance the development of skills and techniques required for aeromedical nursing care of medical and/or surgical patients, as well as those with personality disorders; will acquaint the student with present organization of air evacuation; and will provide student with knowledge of procedures and techniques to be used as expedients in the event of disaster.

Duration: Six (6) weeks

Convening Date: 13 April 1959 and concludes 22 May 1959

Place: United States Air Force Air University
Headquarters, 3882D School Group
Gunter Branch-USAF School of Aviation Medicine
Gunter Air Force Base, Ala.

Submission Date: Applications with enclosures to be submitted no later than 1 February 1959

Enclosures:

1. Two (2) passport size photographs, 2-1/2 x 2-1/2
2. Obligated service agreement of 4 months after completion of course (USN and USNR)
3. In case of Reserves, in addition to obligated service agreement, an extension of active duty must be submitted to BuPers via BuMed to cover the four (4) month period of obligation from completion of the course.
4. SF88, Flight Physical Examination (3 copies)
5. Transcripts of high school, school of nursing, and other schools attended if not previously forwarded to Code 3211
6. Statement that applicant is qualified in swimming

Qualifications:

1. Regular and Reserve Nurse Corps officers
2. A minimum of two (2) years active duty
3. Acceptable high school and school of nursing grades with a good background in the sciences
4. Maximum age limit - 30 years
5. Must meet Flight Physical standards
6. Must be qualified in swimming
7. Individual with sound professional background and with emotional maturity and stability

NOTE: Billets for the course in Flight Nursing are extremely limited in number.

(NursingDiv, BuMed)

From the Note Book

1. Rear Admiral A. S. Chrisman MC USN and Rear Admiral C. B. Galloway MC USN were appointed to their present ranks on December 1, 1958, filling vacancies created that date by the retirements of Rear Admiral F. R. Moore MC USN and Rear Admiral O. B. Morrison, Jr. MC USN. (TIO, BuMed)

2. Two U. S. Navy Medical Corps officers were among six doctors who received major awards for outstanding achievements in military medicine at the closing banquet of the 65th Annual Convention of the Association of Military Surgeons. Captain G. L. Calvy MC USN of the U. S. Naval Hospital, St. Albans, N. Y. was chosen for the Stitt Award, bronze plaque, life membership in the Association, and $500 for his clinical research on antibiotics in combating drug-resistant staphylococcic pneumonia. LCDR J. H. Ebersole MC USN of New London, Conn., Medical Officer of the SEAWOLF, record-breaking atomic submarine, received the Gorgas Medal, scroll, and $500 for outstanding services in radiation protection of the crew. (TIO, BuMed)

3. Captains R. L. Gilman MC USN, V. E. Wagner MC USN, and D. H. McKeague MC USN were recently placed on the retired list of officers of the U. S. Navy. (TIO, BuMed)

4. During the period July 1957 - June 1958, there were a total of 46.9 million persons who sustained injuries which resulted in medical attention or caused restricted activity. This was an average of 27.9 persons injured per 100 persons in the population. It should be remembered that the survey includes data only on persons living at the time of interview, therefore, persons who were injured and died immediately or shortly after the accident are not included in the statistics. (Health Statistics, Series B-5, PHS, HEW)

5. The clinical and epidemiologic observations concerning 45 cases of viral hepatitis are presented. The cases were studied in a penal institution over an 11-month period. The epidemiologic data obtained indicate that parenteral transmission of the serum hepatitis virus via contaminated syringes and needles caused the outbreak. The implication of these findings as related to blood collection programs in a closed population group is discussed. (Ann. Int. Med., November 1958; I. A. Schafer, M. D., J. W. Mosley, M. D.)

6. Classically, primary hyperparathyroidism is manifested by symptomatic complications involving the skeleton or urinary tract. However, hyperparathyroidism may cause atypical symptoms or be present even without symptoms. The authors have reported 20 cases where the diagnosis of hyperparathyroidism was unexpectedly made during the investigation of unrelated conditions. (Am. J. Med. Sci., November 1958; R. V. Randall, M. D., F. R. Keating Jr. M. D.)

7. One hundred mgm of oleandomycin per kilogram of body weight may be given in divided doses every 6 hours by intravenous, intramuscular, or oral routes with few minor side reactions; 97% of staphylococci isolated from significant clinical sources were found to be very sensitive to oleandomycin compared to 92% sensitive to erythromycin. (J. Pediat., December 1958; R. Koch, M. D., L. D. Asay, M. D.)

8. A 5-year pilot study in tuberculin testing began in October 1955. The study was made in certain public and private schools in or near Honolulu. The report lists the objective, describes the techniques and methods used, and gives the findings and impressions of 2 years' experience with this 5-year project. (Am. Rev. Tuberc., December 1958; R.H. Marks, G. Tokuyama, A. Peterson)

9. Acute infectious encephalitis reached epidemic proportions in Japan and Korea during the summer of 1958. Because this is one of the deadliest of the infectious diseases, the epidemic has been watched with concern and has necessarily been regarded by the Navy as a threat to the health of its personnel stationed in and around these areas. (StatNavMed, December 1958)

10. Modification of the standard method for blood volume determination with Cr^{51} tagged red cells has permitted the routine application of this valuable procedure for the proper evaluation and preparation of patients undergoing surgery. (Surg. Gynec. & Obst., December 1958; C. A. Alpert, M. D. et al)

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BUMED NOTICE 5360 26 November 1958

From: Chief, Bureau of Medicine and Surgery
Commandant of the Marine Corps
To: All Ships and Stations

Subj: BuMedInst 5360.1A, Subj: Decedent Affairs Manual

This notice announces the promulgation of subject Manual to all ships and stations under separate cover, and indicates the status of related directives and regulations. The following directives are canceled:

BuMedInst	BuMedInst
5360.1 (Notal)	5360.16 (Notal)
5360.7 (Notal)	5360.17
5360.11 (Notal)	5360.18
5360.13 (Notal)	BuMedNote 5360 of 11 July 1958 (Notal)

Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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SUBMARINE MEDICINE SECTION

Recent Diving Casualties

With no attempt to sort them out, the Director of the Submarine Medicine Division reached into the file folder and removed a dozen of the more recent reports of diving casualties received in the Bureau of Medicine and Surgery.

Five of these reports could be regarded as diving casualties among professional divers. Three came from the same activity where the divers recover torpedos from a muddy bottom at 110-130 feet, using a deep sea air diving rig. It is very hard work. The symptoms were mild pain: right shoulder, 1 case; left shoulder, 1 case; left knee, 1 case. The knee pain case did not obtain relief, although Treatment Table #2 was used. The diver doctor treating the case concluded this probably was not a case of decompression sickness.

Moral: When in doubt, treat as if it is decompression sickness. It was correct in two of these three mild cases. No one knows which mild case will get worse.

A fourth case was an old pro, although he will resent being called old at 43 years. He stands 5 feet, 7 inches and weighs 165 pounds. He was searching from a stage suspended beneath the ship, presumably for a "look around." (Remember the rule: No diver over the side while the ship has way on (screws turning)). He was at 237 feet for 14 minutes on air. At the 10 foot stop, while decompressing on the 240 foot 15 minute table, he developed some itching. Shortly after surfacing, he had some transient pain in one shoulder. Slightly over an hour after surfacing, he developed a persistent pain in his other shoulder. He reported this about 4 hours after surfacing. He was treated according to Treatment Table #2. As pressure was applied, his pain increased at first but gradually eased. After his scheduled stay at 165 feet, the original symptoms had disappeared. There was residual soreness and aching following treatment. This diver has a history of earlier bursitis in both shoulders.

Comment: The decompression schedule chosen was presumably from the old tables because the new schedules have not yet been distributed. In this instance, the margin of safety was sliced quite thin for this man (age) although it was within the limits. Decompression sickness symptoms tend to hit in places of old injury (bursitis of both shoulders). The pad under the breastplate may be a nuisance in some ways, but it serves a purpose (less bruising of the shoulder girdle which may contribute to the bursitis).

The fifth case illustrates a common dilemma. It involves a hospital corpsman diver who was attending a patient in the recompression chamber. The patient got worse and it was necessary to extend his treatment. The corpsman was relieved and brought to the surface as from a dive by the diving officer at the scene. The corpsman noticed pain in the left shoulder 4 and 1/2 hours after surfacing which gradually increased. Nine hours later, the corpsman was treated as a casualty when seen by the submarine medical officer. He was treated on Treatment Table III and did not obtain relief of all symptoms until the treatment was almost completed. Fortunately, relief was complete and there were no residuals.

Moral: Attempts to short cut decompression frequently result in having to sit out the much longer treatment.

The remaining cases cannot be considered as having happened to trained professionals. A man can spend many hours in the water but not learn anything about diving. The fact that he wears a military uniform does not place more gumption between his ears. These cases are too long to permit detailed discussion. They include one fatal case. This service

officer had taken a "course" with a diving club, but on the first dive made with his own scuba equipment, he surfaced long enough to gasp "can't breathe." He was unable to effectively free himself from his equipment. His buddy was out of air and exhausted and could not save him.

Comment: No quick release catches on the scuba nor the weight belt. No emergency flotation gear. No buddy line. Exhaustion. Victim underwater at least 3 minutes. Dead when brought to the beach. Diagnosis: Possible cerebral air embolism.

Another service officer with 9 months activity in the scuba sport was searching for sea shells at 120 feet. His air ran out, his "reserve" valve failed, he became alarmed, tried to get help from his buddy who misunderstood and swam away. The victim surfaced. Later, he said he was forcibly exhaling all the way. In rapid succession, after being pulled into the boat, he developed severe pain in both shoulders, crushing pain in the front of his chest, difficulty in breathing and right sided numbness, dizziness, headache, and nausea. When taken ashore, a chest film was taken and diagnosis of decompression sickness made. He was flown (at 1000 feet altitude) to another island without appearing to get any worse. At this point, examination reported "bubbles" in the conjunctiva, bilateral reddening of the ear drums, vertical bilateral nystagmus and increased deep tendon reflexes on the right. At this island, an attempt was made to give him decompression using another scuba and later a shallow water mask. He could be taken only to 90 feet, but as he descended he got complete relief at 60 feet, except for persistent vomiting. He spent 6 hours following Table 1A, but grew cold and disgruntled and surfaced against advice. A professional diver "gave him the word" so he went back and completed the schedule. At this time, he had only headache and right hyperactive reflexes.

Twenty-four hours after the onset of symptoms, a portable recompression chamber arrived by air from a well equipped diving activity. He was placed in this chamber, taken to the "depth of relief" (66 feet), placed on a 17% oxygen in helium mixture and returned (11-hour flight) to Pearl Harbor. The portable chamber was placed in the larger chamber, the patient got out and he was slowly decompressed over a period of 17 more hours.

Comment: This was a mighty expensive effort to retrieve an avoidable situation. This officer is fortunate it is the American credo that any life is worth saving. His was probably saved in spite of himself.

A third officer, this time retired at 41 years of age, was doing underwater collection of geological specimens. He dove to 220 feet with a single bottle scuba. He found it too cold to stay more than 2 or 3 minutes so came to the surface and climbed into the skiff unaided. Shortly thereafter, he had "spasms in the fingers" and lost consciousness. He was subsequently transferred via passing freighter and a Coast Guard helicopter to a place where

adequate recompression facilities and a submarine medical officer could treat him. Despite recompression, it appeared he would expire. Diagnosis: Decompression sickness, cerebral involvement. He was placed in the recompression chamber at 1620 about 3 hours after he started his dive. At 0634, two days later, the physical examination revealed: Bilateral sensory loss below the level of the lower rib cage, bilateral paralysis below the level of the shoulders, weakness of the right side of the face, responds only occasionally to verbal commands. Reflexes are equal bilaterally but weak to active. Impression: Air embolism to anterior spinal artery at about C-8 and air embolism to left middle meningeal artery (cerebral signs and symptoms). Two months later, the patient had regained the use of his lower limbs and there was evidence of beginning recovery in the upper limbs.

Comment: What a price to pay for ignorance!

The other cases are less dramatic, but each one illustrates some violation, willful or through ignorance, of fundamental principles of safe diving practice. Diving can be acceptably safe. It is a tremendously interesting sport. Short cuts and ignorance of safe practices have no place in diving. Doctors need to know about these problems and not only in order to treat the casualties. The life they save may be their own.

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New Look at Helium-Oxygen Diving

A research report of work done by Duffner and Snider takes a new view of the decompression hazard of helium-oxygen diving. Their studies suggest, in almost complete contrast to previous concepts, that helium-oxygen diving offers no more and possibly less hazard from decompression illness than air diving for a given dive. A review of data of their own, data attributed to Behnke and Willmon, and the work of Hardin Jones led to the conclusion that a large portion of the helium absorbed in the body during a dive is taken up in tissues that saturate and desaturate rapidly (half times of 1.5 to 5 minutes).

All this strongly suggests that if these rapidly saturating tissues are handled by a controlled rate of ascent, helium-oxygen diving may be practical for scuba usage. The saving point here is that the only reason to use helium is to avoid the nitrogen narcosis encountered at depth. Because of volume limitations, the duration of deep scuba dives may not involve an important degree of saturation of the slower tissues. While this is hopeful news on the scuba-diving horizon, it is not any sign that sport divers should take off for the cool dark depths. The rate of ascent business remains to be unraveled more thoroughly. But help is on the way. (U.S. Naval Experimental Diving Unit Research Report 1-59, 18 September 1958)

DENTAL SECTION

Rear Admiral Schantz Attends New York Meeting

Rear Admiral Curtiss W. Schantz DC USN, Chief, Dental Division, Bureau of Medicine and Surgery, represented the Navy at the Greater New York Dental Meeting held at the Statler Hotel, New York City, December 6 - 12, 1958.

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NDS Closed Circuit TV Presents Dental Meeting

In cooperation with the Greater New York Dental Meeting, the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md., presented a two-hour closed circuit dental television program on December 11, 1958. The program was a pioneer demonstration in the coordinated use of low cost color and black and white television equipment over a long distance closed-circuit network. Instructors at the U. S. Naval Dental School presented teaching demonstrations on the subjects of Endodontics, Mouth Preparation for Removable Partial Dentures, Maxillary Immediate Denture Impression, and Preparation of an Anterior Abutment for a Fixed Prosthesis. The entire program was presented with simplified television equipment used routinely for instructional purposes at the National Naval Medical Center. Two television color-camera systems and two black and white camera systems were used during the presentation. The color television camera employed was one specifically designed for clinical, medical, and dental application rather than broadcast studio use. The program demonstrated that such simplified equipment can be used routinely for the purpose of teaching dentistry.

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ADA's 1959 Centennial

In 1959, the American Dental Association will observe the 100th anniversary of its founding. Marking, as it does, the beginning of a new "century of health service" for the profession, the centennial year has profound

significance. During these past 100 years, the profession has experienced phenomenal growth to over 90,000 members. It has attained true maturity and has achieved national and world-wide recognition as a leading health service.

Since the U.S. Navy Dental Corps was authorized in 1912, the American Dental Association has given unyielding support to legislation by which dental officers of the military and health services have benefited significantly. The Dental officers of the Navy enjoy an enviable membership record with the American Dental Association, and now, near the end of a century of professional progress and the beginning of a new "century of health service", is the time to renew memberships in the Association for 1959. Those who are not members should address their applications to the American Dental Association, 222 East Superior St., Chicago 11, Ill. The regular annual fee for members of the Armed Forces is $20 which includes subscription to the Journal of the American Dental Association. Student memberships for recent graduates remain in effect until December 31st of the year the Dental officer graduates and may be renewed for $3.50 for the following year.

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Dental Officer Receives Citation

LT Saul L. Bahn DC USN of the Second Dental Company, Fleet Marine Force, Atlantic, was one of three Dental officers who participated in the landings during the Lebanon military operation last summer. For his part in the success of the operation, LT Bahn was awarded a Certificate of Achievement by the Commanding General, Second Provisional Marine Force, Fleet Marine Force, Atlantic. The award stated in part: "For outstanding performance of duty in the line of his profession while serving with the 2nd Battalion (Reinforced), 2nd Marines during the Lebanon military operation from 15 July 1958 to 15 August 1958. As Battalion Dental Officer, Lieutenant Bahn consistently exhibited the highest qualities of leadership and devotion to duty . . . As a result of his foresight in requisitioning supplies and his unceasing devotion to his profession, personnel from the 2nd Battalion and other Marine Battalions were treated quickly and efficiently. . . . His attention to duty, excellent professional ability and outstanding qualities of leadership were in keeping with the highest standards of the United States Naval Service."

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Change of Command

Captain James L. Wanger DC USN assumed command of the U.S. Naval Dental Clinic, Naval Gun Factory, Washington, D.C., November 19,

1958. Captain Wanger relieved Captain George C. Rader DC USN, Acting Commanding Officer. Prior to his new assignment Captain Wanger was on duty at the U. S. Naval Dental Clinic, Pearl Harbor, T.H. Captain Rader is under orders to duty in the Dental Division, Bureau of Medicine and Surgery.

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Professional Notes

Captain R. B. Lytle DC USN, on the staff of the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md., presented a registered clinic on "Occlusal Correction of Complete Dentures" at the Greater New York Dental Meeting, 6 - 12 December, 1958.

Captain Robert H. Loving DC USN, on duty at the Dental Department, Administrative Command, U. S. Naval Training Center, Great Lakes, Ill., recently spoke on "Periodontal Problems" before the Waukegan (Ill.) Dental Study Club.

Captain Frank T. Wais DC USN, on duty at the U. S. Naval Air Station, Pensacola, Fla., recently presented a clinic on "Practical Aspects of Endodontic Problems" before the monthly meeting of the Greater Pensacola Dental Society and the study group of the Fourth Dental District of Alabama, Monroeville, Ala.

Navy Dental Corps officers, Captain John P. Jarabak and Lieutenant W. J. Porter of the Dental Department, U. S. Naval Hospital, Camp Lejeune, N. C., were recent essayists before the Craven County Dental Society, New Bern, N. C., The topic of their presentation was "Differential Diagnosis in Oral Medicine."

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MEDICAL RESERVE SECTION

Postgraduate Course in Ophthalmic Pathology

A postgraduate course in Ophthalmic Pathology will convene at the Armed Forces Institute of Pathology, Washington, D. C., 9 - 13 March 1959.

This course will consist of a basic and comprehensive survey of pathologic conditions affecting the eye. The subjects will include a review of normal histology of the eye; changes incident to growth and aging; a review of general inflammation; acute, chronic, and granulomatous lesions and their sequelae; injuries, cataract, glaucoma, and vascular diseases; intraocular tumors, and epibulbar and orbital inflammatory and neoplastic lesions. The material will be presented through lectures, demonstrations, and study of microscopic slides.

Applications from Navy Medical Department officers on active or inactive duty will be forwarded through channels to: Chief, Bureau of Medicine and Surgery, Department of the Navy, Washington 25, D. C., six (6) weeks prior to the opening date of the course. Priority will be given to officers who are board certified, board qualified, or residents in a specialty related to the course desired.

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Radioisotopes in Medicine - NavPers 10773
1958 Edition

In recent time, perhaps no single development has stimulated the imagination of scientists as has the radioisotope. The use of radioactive substances in medicine began soon after the discovery of radium and expanded rapidly in the decades between the two World Wars. However, it was not until the development of the nuclear reactor during World War II that a large assortment of artificially produced radioisotopes, in appreciable quantities and at a practical price, became generally available for medical use. Rapid advancement in radio-medical research has brought isotopology in a few short years to the status of a major branch of medical science.

This correspondence course will be of special interest to all Medical Corps officers. It is based on Radioisotopes in Medicine, the articles presented at the actual course given by the Oak Ridge Institute of Nuclear Medicine.

The lecturers were selected because of their reputation in some specific application of radioisotopes and represented all sections of the country. The work was accomplished under contract with the United States Atomic Energy Commission. The course is intended as a study of a fairly well-known body of knowledge and is definitely not to be considered a seminar on research.

This correspondence course provides Medical Corps officers with the proceedings of the second advanced medical course given at the Institute of Nuclear Medicine and emphasizes practical clinical radioisotope techniques. It will also furnish the enrollee with new vistas into a tremendous number of potential medical applications of radioisotopes, still unexplored.

The course consists of seven (7) objective type assignments and is evaluated at twenty-one (21) Naval Reserve promotion and/or nondisability retirement points.

Application Instructions

1. The form, Application for Enrollment in Officer Correspondence Course, NavPers 992 (Rev 1/57) or later revision, should be appropriately filled out and forwarded to the Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md. Make the appropriate change in the "To" line in Box J of the application form. These forms can be obtained from your Commanding Officer or from the respective District Headquarters.

2. Completed applications will be forwarded as follows:

a. If on active duty: via your Commanding Officers.

b. If on inactive duty and not in a training program under the cognizance of the Chief of Naval Air Reserve Training (CNART): via your Naval District Commandant.

c. If on inactive duty and in a training program under the cognizance of CNART: via the Commanding Officer of NAS or NARTU having responsibility for the training program.

d. If on inactive duty and residing in a foreign country: via (1) the local Naval Attache or Force Commander, if any, and (2) the command maintaining your service record (usually your home District Commandant).

3. Caution! Do not send applications for enrollment in Medical Department correspondence courses to the U.S. Naval Correspondence Course Center, Naval Supply Depot, Scotia 2, New York. Such procedure delays the processing of the application for several weeks. Send to that address only applications for enrollment in courses administered by that center.

Multiple Enrollment. Medical personnel may be enrolled in more than one Medical Department correspondence course at one time.

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PREVENTIVE MEDICINE SECTION

Status of Fight Against Poliomyelitis

The 1958 poliomyelitis season apparently passed its peak during the third week of September and the number of cases reported for the remainder of the year slowly declined. In order to determine where the Nation stands in the fight against polio, data were compiled for the first 9 months of 1958 and compared with data for the first 9 months of 1957 and previous years.

Two main facts stand out:

1. An increase in the total number of paralytic cases over 1957: 1815 cases during the first 9 months of 1958; 1577 cases in the same period of 1957. The fact that the total number of paralytic cases increased in 1958, for the first time since the introduction of Salk vaccine, underscores the importance of vaccination. Among the 1815 persons who had paralytic polio during this period, there were 162, or less than 10%, who had had the basic three injections and 9 had had a fourth, or booster, shot.

2. A concentration of cases among unvaccinated children under 5 years of age: Of a total of 781 paralytic cases reported by 6 States, 416, or over one-half, occurred among children under 5. Eighty percent of these children had had no vaccine. It seems probable that, if an analysis were made of cases in the other States, comparable results would be found.

The increase in the number of paralytic cases in 1958 is no reflection upon the efficacy of the vaccine. During the 3-1/2 years it has been in use, the effectiveness rate of 60 to 90% has been consistently maintained. Nor is there any evidence that properly vaccinated persons are losing their immunity and becoming more susceptible to polio. Children who participated in the 1955 school vaccination campaign had a lower attack rate in 1958 than children in the age brackets above and below them. This was also true during 1956 and 1957.

The Public Health Service's Communicable Disease Center at Atlanta, Ga., which keeps constant watch on developments affecting the incidence of poliomyelitis, reports that no cases of polio which could be traced to any lot of vaccine have occurred in over 200 million doses administered since May 1955. Also, not a single instance of provocation of polio has occurred in

communities where vaccination campaigns have been carried on during an epidemic. Outstanding examples of this are Chicago in 1956 and Detroit in 1958 where intensive vaccination campaigns were waged at the height of epidemics.

Physicians, health officials, and public-spirited citizens—assisted by the wholehearted support of the press, radio, and television media—made a concerted effort in 1958 to encourage people to protect themselves against polio by getting vaccinated. As a result, some 12.4 million additional persons started their vaccinations, and over 22 million took the additional shots needed to complete their vaccinations. Nevertheless, 53% of the susceptible population under 40 have not yet had the 3 basic injections, and almost 38% of them have had no vaccine at all.

A new estimate of the number of persons vaccinated based on a sample survey conducted in September 1958, indicates that 72.4 million persons have had one or more injections of the vaccine and about 54.5 million of them have had three or more injections. In 1957, when a similar sample survey was taken, about 60 million persons had had one or more injections and 32 million of them had had at least three injections.

Failure to make far more substantial progress in the direction of 100% participation in the vaccination program is attributable almost certainly to indifference. This is very difficult to comprehend when one considers what is at stake. (L. E. Burney, S. G., PHS, Report to the Secretary of Health, Education, and Welfare on the 1958 Poliomyelitis Season, October 1958)

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Labels on Germ-Fighting Chemicals

To be sure just what protection can be expected from the various germ-fighting chemicals available for use in kitchens, bathrooms, nurseries, industrial plants, or hospitals, the labels on these products must be studied carefully. All such labels must be reviewed and accepted by Department of Agriculture (USDA) specialists if the products are offered for sale interstate.

About 7000 sanitizing or germicidal preparations now on the market claim bacteria-destroying properties that give some degree of protection to health. Many of these products are for use in homes and they range from liquid disinfectants to bleaches, from sweeping compounds to paints, from kitchen-cleaning powders to floor waxes, from laundry detergents to vaporizers.

Users may well be confused on such questions as: What is the difference between an antiseptic and a disinfectant? What is a bacteriostat? What does "sanitize" mean? Do deodorants kill germs?

USDA registers certain antimicrobial chemicals for movement in interstate commerce under a Federal law regulating sale of "economic poisons."

Not included are antiseptics used on man or animals which are regulated by the U. S. Food and Drug Administration, Department of Health, Education, and Welfare. All germicidal chemicals used on inanimate surfaces come under USDA's jurisdiction. Before a product is registered, a list of ingredients, directions for use to obtain the results claimed, and precautions in handling must appear on the label. Label statements must be both factual and clear.

Bacteriologists of USDA's Agricultural Research Service draw a sharp distinction between chemicals that claim to be sterilizers, germicides, disinfectants, or fungicides, and those that are sold as fungistats, bacteriostats, or sanitizers.

Sterilizers must kill all bacteria when used as directed. Germicides and disinfectants must kill all bacteria except resistant spore-forming species. Fungicides must kill fungi.

Bacteriostats must prevent the growth of bacteria. Fungistats must stop development of fungi. Sanitizers must reduce bacterial counts to safe levels as may be judged by public health requirements.

An antiseptic may be either a germicide or a bacteriostat, depending on its use, but the word is usually used for preparations applied to living rather than inanimate things.

Each of these types of materials has its place. Germicides, disinfectants, and sterilizers are most often used by hospitals, barber shops, beauty parlors, and on farm premises where preventing the spread of contagious diseases is necessary to safeguard public health or the health of domestic animals.

Sanitizers are most often used in restaurants, food and beverage plants, and home kitchens and bathrooms in the day-to-day maintenance of sanitary conditions. In routine cleaning operations, they add in varying degree to the efficacy of ordinary soap-and-water cleaning in maintaining a hygienic environment. Unless a sanitizing chemical clears a surface of bacteria significantly better than does ordinary soap alone, its label cannot legally claim sanitizing properties.

Bacteriostatic and fungistatic deodorants may add another "plus" to cleanliness by preventing the growth of odor-causing bacteria and fungi. Deodorants as such are not subject to regulation by the USDA, but if their deodorizing efficiency is ascribed to antimicrobial activity, they must then be registered as economic poisons. Space deodorants and air sanitizers do not provide "fresh" air and cannot act as efficient substitutes for adequate ventilation.

Chemicals specifically registered for use in hospitals must meet special standards of germicidal activity. Of the 7000-odd bacteria-fighting materials legally permitted to move in interstate commerce today, only about 450 have been accepted "for hospital use."

Basically, no product can bear a label recommending it for use in hospitals unless it is effective against both pyogenic (pus-forming) and

enteric (intestinal) bacteria. Also, USDA bacteriologists hold that no sanitizing result short of complete disinfection can be of much practical use in hospitals.

Directions must be followed carefully to make the best use of germ-killing preparations. Germicidal effectiveness is usually a two-step process—first clean, then disinfect. However, there appears to be a growing demand for products that will clean and disinfect at the same time.

While surfaces that have been chemically treated may have some antibacterial action on germs that later fall on them, no one can guarantee that a germ-free surface will stay that way.

Self-regulation within the chemical industry itself is a great help in protecting the public against over enthusiastic claims for germ-fighting products.

Coined names for "miracle ingredients" in sanitizers may raise questions when manufacturers apply for registration and USDA acceptance of the labels on their products. While such names may be used extensively in advertising, the product labels must carry the well-known common name or the correct chemical name of each active ingredient—the actual germicidal or sanitizing agents—in a form specified by law.

National advertising of registered chemicals is regulated by the Federal Trade Commission which works closely with USDA to keep exaggerated claims out of print. However, USDA regulatory workers check for accuracy all collateral labeling—publicity which accompanies the product—such as display placecards and handouts that appear in retail stores and leaflets that go with the package.

USDA advises consumers to be wary of unstated but implied claims. The ingredient statement and carefully-worded claims for effectiveness that appear on the product label may lack persuasiveness, but they are dependable guides to the actual germ-fighting value of the product. (Release: Labels Tell What Germ-Fighting Chemicals Will Do: U. S. Department of Agriculture, 1 July 1958)

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Driver's Responsibility Before and After an Auto Accidnnt

A driver should do certain things before an accident happens:

1. Realize that no one is accident proof. Last year, 1 out of 4 licensed drivers—about 18 million persons—were involved in automobile accidents in the United States.

2. Acquaint himself with legal responsibilities. State driver's manuals contain such information. Failure to stop, render aid, notify police, and make a report will bring arrest with penalties of a possible jail sentence, fine, and loss of driver's license. Some states also require drivers

to be covered for, or able to pay, damages arising from the accident regardless of who caused it.

3. Carry accident equipment. Pen, pencil, paper for recording accident information; flash light or lantern, flares, warning devices for day or night for use as emergency gear; first aid kit; Red Cross first aid manual; blankets; state driver's manual; and vehicle code.

4. Most important, a driver should never take to the road unless his car is in top mechanical condition and he's in top physical and mental shape.

Driving safely without accident is the driver's greatest challenge; his next biggest challenge is to act properly if he does become involved in an accident. Prompt and correct action can prevent further loss of life or injury and avert legal snares which might develop. "Musts" for accidents are:

Stop immediately at the accident scene or as close to scene as possible. Try not to obstruct traffic. Turn off ignition of damaged car at once. Do not smoke.

Help Injured. Get medical aid if needed. Call ambulance or doctor, whichever is quicker. Administer first aid if qualified. Do not move seriously injured unless absolutely necessary. Use Red Cross manual as guide.

Protect Scene against further accidents by moving vehicles out of way if feasible. If not, put out flags, flares, or flashlights. Station persons to warn other traffic.

Notify Police (city, county, or state) immediately if persons are injured or property damage exceeds specified legal minimum amount (usually $50) to one or both vehicles.

Important follow-ups are:

Identify Other Driver and Occupants. Obtain other driver's name, address, and registration number and ask him to show you his driver's license. State law requires accident drivers to provide this information. If car is not owned by driver, get owner's name and address. Also note names and addresses of occupants and their seating positions.

Locate Witnesses. Obtain names and addresses of all witnesses as soon as possible. Witnesses include those who saw accident or might have information about circumstances of mishap. If possible, get them to sign a statement.

Collect Information for Report. Make notes and diagram of accident. Show position of car after accident, be able to identify point of contact where vehicles collided, step off distances of skid marks and other significant distances involved. If camera is available, take pictures of physical evidence. Also get doctor's name and address, name of hospital where injured were taken, and badge number and precinct of barracks location of officers.

See a Doctor. Even if driver notices no ill effects, he should be examined by a doctor. Some injuries do not show up immediately but cause serious complications later.

Make Prompt Reports to:

State. Most states require an accident report on proper form within 24 hours to 10 days if there is injury or death or total damage is $50 or

more (amount varies in some states). Forms are available from state, county, and city police; garages, service stations, motor clubs, et cetera. Driver must file report whether or not he was at fault, whether or not the accident has been investigated and reported by proper authorities.

Insurance Company. Driver should make complete report to his insurance company as soon as possible. Failure to make prompt and complete report may void his insurance. This applies to all insurance agencies involved—accident, hospitalization, et cetera.

Car Owner. If driver does not own car he should provide owner with all available facts as soon as possible so owner can meet legal requirements.

In addition, driver should also be prepared to submit follow-up reports on new information or upon request of official agencies for further details.

If Other Driver Fails to Stop. Immediately attempt to get best description of hit and run vehicle, driver, and vehicle occupants. Look for unusual car clues, such as broken window glass, fender and body dents, and paint color. For driver and occupant identification, check such things as hair and skin coloring, baldness, glasses, clothing, loud voices, racial characteristics.

Get information to police as quickly as possible. They may be able to apprehend driver and vehicle while still on the street. Locate and question witnesses, examine scene for parts of vehicle which may have come off in crash, notify policy of further developments. In addition, follow general steps for drivers involved in accidents. (Traffic Safety, October 1958)

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